Br. J. Cancer (1975) **32**, 678

THE LACK OF ASSOCIATION OF θ STATUS AND MURINE LEUKAEMIA VIRUS CONTENT IN THE AKR

R. D. BARNES AND K. BROWN

From the Clinical Research Centre, Harrow, and University College Hospital, London

Received 28 May 1975 Accepted 4 September 1975

Summary.—Two AKR sublines appear atypical in possessing θ^{C3H}. One of these two sublines—AKR/FuA—is notably resistant to lymphomata and is also characterized by reduced levels of the group specific murine leukaemia viral (MuLV) antigen. This suggested a possible association between θ status tumour susceptibility and viral content. Results here show no reduction in viral antigen titres in the other θ^{C3H} tumour susceptible subline AKR/Cum, thus eliminating the possible association of θ status with the extent of MuLV replication.

ACTON and his colleagues initially drew attention to the existence of 2 AKR sublines possessing θ^{C3H} rather than the normally characteristic θ^{AKR} (Acton *et al.*, 1973). These two sublines, namely AKR/FuA and AKR/Cum, also appeared atypical in other aspects since both were alleged to be relatively resistant to lymphomata (Acton *et al.*, 1973). Recently we showed, however, that this was not the case in the AKR/Cum which has an incidence of lymphomata comparable with the susceptible AKR/J (Barnes, unpublished data). Therefore, having upon the basis of this finding dismissed the possible association between θ status and lymphoma susceptibility, we have sought to learn if there was any direct association between θ status and viral content in the AKR/Cum since Acton (Acton *et al.*, 1973) had earlier noted that levels of the group specific murine leukaemia viral (MuLV) antigen were notably less in the θ^{C3H} tumour resistant AKR/FuA.

MATERIALS AND METHODS

Mice.—AKR/Cum mice were obtained directly from Cumberland Farms and compared with our AKR/Crc which were originally derived from AKR/J.

The incidence of lymphomata in the AKR/Crc has been described previously (Barnes *et al.*, 1975), and preliminary findings suggest that the AKR/Cum is equally susceptible. The differing θ status of the 2 sublines has also been confirmed earlier (Barnes unpublished data).

Investigation.—Various tissues were obtained from the mice at different ages and MuLV/gs titration was performed on soluble extracts according to the technique of Hilgers (Hilgers *et al.*, 1972). This technique involves indirect immunofluorescent absorption and is performed in 2 stages. In the first stage the specific anti-MuLV-gs serum is titrated against target AKR-A lymphoma cells (Woods *et al.*, 1970). The second titration of the same antiserum is then performed after absorption with soluble antigens obtained in the case of solid tissues following ultrasonic disintegration. The gs-antigen titre was then expressed as the reciprocol of the reduction in antibody titre following absorption.

DISCUSSION

The incidence of " spontaneous " lymphomata is known to vary in the AKR and this remains unexplained. The recent description of 2 sublines possessing θ^{C3H} and the fact that both were allegedly lymphoma resistant (Acton *et al.*, 1973) led us to question the possible association

TABLE I.—*MuLV-gs Titres in AKR/Cum*

No.	Age (weeks)	Lymphoma	Tissue						
			Thymus	Lymph nodes	Spleen	Bone marrow	Liver	Kidney	Sera
1	20	+	16	16	nt	2	8	4	8
2	32	−	nt	16	4	0	1	0	0
3	36	+	16	16	nt	2	8	1	16
4	40	−	8	2	4	0	2	1	0
5	40	+	8	4	2	0	2	1	0
6	40	+	16	8	4	4	4	0	2
7	40	+	16	16	nt	2	16	4	0
8	40	+	16	16	16	1	8	2	1
9	40	−	nt	nt	4	2	1	1	nt
10	44	−	2	2	2	4	2	0	1
11	44	+	8	4	2	0	2	0	1
12	44	+	16	8	8	4	4	8	1
13	44	−	8	2	16	0	2	1	0
14	44	−	nt	4	2	0	0	2	0
15	44	−	8	2	4	0	1	2	0
16	44	−	4	4	4	0	2	0	1
17	44	−	8	2	8	0	2	0	nt

(Results expressed as reciprocol of immunofluorescent absorption titres.)

TABLE II.—*MuLV-gs Titres in AKR/J(AKR/CRC)*

No.	Age (weeks)	Lymphoma	Tissues*						
			Thymus	Lymph nodes	Spleen	Bone marrow	Liver	Kidney	Sera
20	20–40	−	2–8	2–16	4–8	0–4	1–8	0–4	0–1
20	30–44	+	8–16	4–16	8–16	2–4	2–16	2–8	4–16

(Results expressed as reciprocol of immunofluorescence absorption titres.)
* Titre range.

between lymphoma susceptibility and θ status. Since the AKR/Cum are not resistant to lymphomata this rules out this possible association (Barnes, unpublished data).

The fact that the titres of viral antigen in the AKR/FuA are notably less than in the AKR/J (Acton *et al.*, 1973) also raised the possible direct association between viral replication and θ status. This association is ruled out by the findings here in the θ^{C3H} AKR/Cum, leaving the possibility that another factor influences viral replication and that this in turn might effect lymphoma susceptibility.

REFERENCES

ACTON, R. T., BLANKENHORN, E. P., DOUGLAS, T. C., OWEN, R. D., HILGERS, J., HOFFMAN, H. A. & BOYSE, E. A. (1973) AKR Mice—Genetic Variation among Sublines. *Nature, New Biol.*, **245**, 8.

BARNES, R. D., TUFFREY, M. & FORD, C. E. (1973) Suppression of Lymphoma Development in Tetraparental AKR Mouse Chimaeras Derived from Ovum Fusion. *Nature, New Biol.*, **244**, 282.

HILGERS, J., NOWINSKI, R., GEERING, G. & HARDY, W. (1972) Detection of Avian and Mammalian Oncogenic RNA Viruses (Oncornaviruses) by Immunofluorescence. *Cancer Res.*, **32**, 98.

WOODS, W. A., WIVEL, N. A., MASSICOT, J. G. & CHIRIGOS, M. A. (1970) Characterization of a Rapidly Growing AKR Lymphoblastic Cell Line Maintaining Gross Antigens and Viral Replication. *Cancer Res.*, **30**, 2147.